Brookhaven National Laboratory **National Synchrotron Light Source**	**Number:** LS-PPS-0007	**Revision:** C
	Effective: 6/26/03	**Page** 1 of 4

Subject: **X17 Transport Hutch** Radiological Interlock Test		
Prepared/ **Approved By:** M. Buckley	**Approved By:** S. Buda	

*Approval signatures on file with master copy.

Revision/Periodic Review Log

Test Reason:	Test Result:	☐ Passed	☐ Failed
	Test Type:	☐ Full	☐ Partial
Test Date:	Start Time:		Finish Time:
Tester 1:	Assistant 1:		
Tester 2:	Assistant 2:		

PREPARATION:

Inform control room operator that test will be done. _____

Turn off 'Red Tag' switch on x-ray ring interlock, and apply LOTO to X-Ray Security system. _____

Verify that vacuum valves and water interlocks are satisfied on X17B and 17C. _____

Enable X-17B1 and X17C. _____

1. Search the transport hutch

   The overhead lights go out _____

   The red interior light comes on _____

   The audible alarm sounds for 13 to 15 seconds minimum _____

   The interlock sign turns on _____

2. Open hutch door

   The hutch interlock sign goes out _____

3. Press CS-1, close hutch door and wait.

   Hutch interior lights come on in not more than 20 seconds _____

   Press CS-E.

   Interlock does not activate _____

4. Press interior search button, close door, press CS-E, note that alarm comes on, open and close door, press CS-E again. (This must all be done in less than the timeout interval noted in step 3).

   Interlock does not activate _____

   X17B

5. Put X-17B1 in white mode, search hutch, satisfy keys and other interlocks. Search transport hutch, one person remains inside.

   The STRESS Shutter "enable" light at the X17B1 hutch does not come on until the end of the warning interval _____

6.   The person inside presses an Emergency Stop Button.

	ES1	**ES2**
The X17B1 shutter "enable" light goes out	_____	_____
The ES indicator at the transport hutch comes on	_____	_____
The ES latch cannot be reset unless the SOR key is turned	_____	_____

7.   At transport hutch, place latch device on door lock so key can be removed. Place switch holders on the three door switches. Search hutch, put door key in SRU, and open X17B STRESS & BLISS.
Remove holder from switch 2B.

      RIB latch light comes on   _____

8.   Replace holder on switch 2B.

      RIB cannot be reset unless SOR key is turned.   _____

9.   Remove holder on switch 1.

      STRESS shutter closes   _____
      BLISS shutter closes   _____
      RIA latch light comes on   _____
      Trans. Hutch interlock drops   _____
      RIA can't be reset w/o SOR   _____

10.   Replace holder on switch 1. Search hutch and leave STRESS & BLISS closed.
Transport Hutch Kirk key (KKH) cannot be removed from SRU unless button is pushed   _____

11.   Open STRESS & BLISS.

      KKH cannot be removed even if button is pushed   _____

12.   Close shutters. Turn transport KKH and note where solenoid unit stops rotation. Push the button and turn key just beyond this point, but not far enough to actuate "key removed" switch. Release the button and leave key in this position. Open STRESS & BLISS, remove KKH, and replace.

      RIA latch light comes on   _____
      RIB latch light comes on   _____
      The STRESS closes   _____
      The BLISS closes   _____

13.   Reset RIA and RIB. Open safety shutter, and press an emergency stop button.

      RIA latch light comes on   _____
      RIB latch light comes on   _____
      Hutch interlock drops out   _____

   Reset RIA, RIB and ES

14. Search transport hutch. Switch X17B to Mono Mode to put Direct Beam Stop (DBS) in UP (mono) position. Open STRESS (BLISS stays closed). Remove holder from transport hutch door switch 2B.

                 RIB latch light comes on   _____

   Replace holder on switch 2B and release switch 1.

                 RIA latch light comes on   _____

                 STRESS closes   _____

   Reset RIA, RIB and ES

X17C

15. Search X-17C hutch, and satisfy keys and other interlocks. Search transport hutch.

                 The Safety Shutter "enable" light at the X17C hutch does not come on until the end of the warning interval   _____

16. Press an Emergency Stop Button in the transport hutch.

	ES1	**ES2**
The X17C shutter "enable" light goes out	_____	_____
The ES indicator comes on	_____	_____
The ES latch cannot be reset unless the SOR key is turned	_____	_____

17. Search transport hutch, put door key in SRU, open X-17C safety shutters. Remove holder from switch 2C.

                 RIB latch light comes on   _____

18. Replace holder on switch 2C.

                 RIB cannot be reset unless SOR key is turned   _____

19. Remove holder on switch 1.

                 Safety shutter closes   _____

                 RIA latch light comes on   _____

                 Hutch interlock drops out   _____

                 RIA can't be reset w/o SOR   _____

20. Replace holder on switch 1. Search transport hutch and leave shutters closed.

                 Transport Hutch Kirk key (KKH) cannot be removed from SRU unless button is pushed   _____

21. Open safety shutter.

                 KKH cannot be removed even if button is pushed   _____

22. Close shutter. Turn transport KKH and note where solenoid unit stops rotation. Push the button and turn key just beyond this point, but not far enough to actuate "key removed" switch. Release the button and leave key in this position. Open X17C shutters, remove KKH, and replace.

                 RIA latch light comes on   _____

                 RIB latch light comes on   _____

                 X17C BLISS & STRESS closes   ____ _____

23. Reset RIA and RIB. Search hutch. Open safety shutter and press an emergency stop button.

                         RIA latch light comes on   _____

                         RIB latch light comes on   _____

                         X17C BLISS & STRESS close   ____   _____

     Reset RIA, RIB and ES

24. Search transport hutch. Open X17C STRESS by pressing button on solenoid. BLISS remains closed.

     Remove holder from transport hutch door switch 2C.

                         RIB latch light comes on   _____

     Replace holder on switch 2C and release switch 1.

                         RIA latch light comes on   _____

25. Close X17C STRESS. Search hutch. Turn off air to X17C STRESS, cycle shutter open & closed until the X17C STRESS remains closed when open button is pressed.

     Open X17C BLISS and release switch 2.

                         RIB latch light comes on   _____

     Replace holder on switch 2C and release switch 1.

                         RIA latch light comes on   _____

                         BLISS closes   _____

     Reopen the air valve.

26. Remove the holders from the switches on the transport hutch. Remove the latch device from the lock. Stand inside the hutch and open and close the door.

                         All three door switches operate freely and each

                         makes a "click" when door is opened   ___   ___   ___

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